Amendments to the claims

1. (Currently amended) A method for host vehicle internetworking, comprising:

coupling a plurality of network elements in a vehicle, the vehicle including at least one node and at least one vehicle bus that is connected to ~~among~~ at least one peripheral electronic device, wherein the at least one node includes at least one gateway node in the vehicle, the gateway node comprising a first processor performing real-time processes and a second processor performing remaining processes other than the real-time processes;

the at least one node manipulating node information including configuration and security information;

the plurality of network elements automatically assembling and configuring ~~the plurality of network elements~~ in response to the node information;

the plurality of network elements coupling the at least one node to at least one remote computer;

the at least one remote computer remotely controlling at least one function of the plurality of network elements; and

the at least one node providing secure interoperability among the plurality of network elements in response to the node information.

2. (Original) The method of claim 1, further comprising accessing the at least one node and performing at least one function using at least one local development network, wherein the at least one function is selected from a group consisting of upgrading, diagnosing, and programming.

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3. (Original) The method of claim 1, further comprising manipulating and transferring entertainment software among the plurality of network elements using at least one local development network, wherein the entertainment software comprises at least one entertainment feature selected from a group consisting of video, audio, movies, television shows, music, games, and simulations.

4. (Original) The method of claim 1, wherein the at least one vehicle bus comprises at least one bus selected from a group consisting of at least one Original Equipment Manufacturer (OEM) bus, at least one Automotive Multimedia Interface Consortium (AMI-C) bus, at least one external network, and at least one local development network.

5. (Original) The method of claim 1, wherein the at least one vehicle bus comprises at least one legacy automotive bus selected from a group consisting of Audio Control Protocol (ACP) buses and Standard Corporate Protocol (SCP) buses.

6. (Original) The method of claim 1, further comprising coupling the at least one peripheral electronic device to at least one OEM bus, wherein the at least one peripheral electronic device is selected from a group consisting of climate control devices, actuator devices, position location devices, Global Positioning System (GPS) devices, communication devices, cellular telephony devices, processing devices, diagnostic devices, modems, video devices, audio devices, multimedia devices, electronic game devices, sensor devices, switch devices, and device subnetworks.

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7. (Original) The method of claim 1, further comprising coupling the at least one peripheral electronic device to at least one AMI-C bus, wherein the at least one peripheral electronic device is selected from a group consisting of communication devices, position location devices, GPS devices, communication devices, pager devices, cellular telephony devices, processing devices, modems, video devices, audio devices, multimedia devices, electronic game devices, personal digital assistants (PDAs), and wireless local area network (LAN) devices.

8. (Original) The method of claim 1, wherein the at least one node comprises at least one interface port selected from a group consisting of Intelligent Data Bus (IDB-C) ports, MOST ports, Institute of Electrical and Electronics Engineers (IEEE) 1394 ports, On-Board Diagnostic-II (OBD-II) ports, Standard Corporate Protocol (SCP) ports, Audio Control Protocol (ACP) ports, Bluetooth ports, Personal Communications Service (PCS) ports, Global System for Mobile Communications (GSM) ports, and Ethernet ports.

9. (Original) The method of claim 1, further comprising:

hosting the at least one function on a central network element;

distributing the at least one function among the plurality of network elements in response to a coupling of additional peripheral electronic devices to the at least one vehicle bus.

10. (Previously presented) The method of claim 1, wherein the at least one node includes the at least one gateway node and at least one port node, wherein the at least one node

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provides at least one function selected from a group consisting of data processing, data storage, access control, protocol translation, security including service discovery and device authentication, and network control.

11. (Previously presented) The method of claim 10, further comprising:

performing real-time operations using the first processor, wherein the first processor includes at least one real-time interface processor (RTIP);

performing high level processing functions using the second processor, wherein the second processor includes at least one application processor, wherein the at least one gateway node further comprises at least one interface port.

12. (Previously presented) The method of claim 11, further comprising controlling at least one high-speed bus of the at least one RTIP using at least one coupled device, wherein the at least one gateway node functions as an Internet Protocol (IP) router.

13. (Original) The method of claim 11, further comprising providing at least one item selected from a group consisting of a tag, a bridge, and an interface with the at least one interface port.

14. (Original) The method of claim 11, wherein the at least one interface port includes at least one port selected from a group consisting of wired communication ports and wireless communication ports.

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15. (Previously presented) The method of claim 10, wherein the at least one gateway node includes a first gateway coupled to a second gateway.

16. (Original) The method of claim 10, further comprising coupling the at least one port node to at least one subnetwork.

17. (Original) The method of claim 10, further comprising coupling a first vehicle bus and a second vehicle bus using the at least one gateway node, wherein the at least one port node couples the at least one vehicle bus to the at least one peripheral electronic device.

18. (Original) The method of claim 10, wherein the at least one port node comprises at least one device selected from a group consisting of at least one processor, at least one memory cache, at least one wireless modem, at least one network protocol, at least one policy, and at least one wired local area network (LAN).

19. (Previously presented) The method of claim 10, wherein the at least one port node comprises at least one device selected from a group consisting of at least one micro real-time interface processor (RTIP), at least one appliance interface, at least one communication interface, and at least one memory device.

20. (Original) The method of claim 19, further comprising:

coupling the at least one appliance interface to at least one sensor;

coupling the at least one communication interface to at least one radio.

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21. (Original) The method of claim 10, farther comprising enabling operation of the at least one peripheral electronic device within the network using interactions among the at least one port node and at least one corresponding proxy, wherein the at least one port node comprises at least one port node selected from a group consisting of a serial network interface connector (SNIC) and a public network port (PNP).

22. (Original) The method of claim 1, wherein the at least one node comprises at least one hybrid switch, wherein the at least one hybrid switch includes at least one interface port coupled among at least one switch of a first speed and at least one switch of a second speed, wherein each of the at least one switch of a first speed and the at least one switch of a second speed are coupled to at least one port.

23. (Original) The method of claim 22, further comprising distributing at least one switching function among the plurality of network elements using the at least one hybrid switch.

24. (Previously presented) The method of claim 22, further comprising:

coupling at least one application of a first type through the at least one port to the at least one switch of a first speed;

coupling at least one application of a second type through the at least one port to the at least one switch of a second speed.

25. (Original) The method of claim 1, further comprising coupling the at least one node

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to at least one subnetwork comprising at least one device selected from a group consisting of sensor devices, actuator devices, wired network devices, and wireless network devices.

26. (Original) The method of claim 1, further comprising coupling at least one router of the at least one node to the Internet using at least one device selected from a group consisting of at least one bus and at least one communication device, wherein the at least one bus is selected from a group consisting of an IEEE 1394 bus, a MOST bus, an IDB-C, and an Ethernet bus, wherein the at least one communication device is selected from a group consisting of a Bluetooth modem, an IEEE 802.11 radio, and a mobile telephone.

27. (Original) The method of claim 1, further comprising generating at least one hierarchy of communication alternatives in response to a determined position of a host vehicle, wherein a selected communication alternative is used to communicate with at least one local site.

28. (Original) The method of claim 1, further comprising controlling data processing using at least one processing hierarchy that controls at least one event selected from a group consisting of data classifications, data transfers, data queuing, data combining, processing locations, and communications among the plurality of network elements.

29. (Original) The method of claim 1, further comprising distributing the at least one function among the plurality of network elements.

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30. (Original) The method of claim 1, wherein the at least one function of the at least one node includes at least one function selected from a group consisting of data acquisition, data processing, communication management, data routing, data security, programming, node operation, protocol translation, network management, and interfacing with at least one communication physical layer including cellular telephony, wireline telephone, satellite telephony, packet radio, microwave, optical.

31. (Original) The method of claim 30, further comprising distributing data processing functions of at least one peripheral electronic device among at least one other processor selected from a group consisting of the at least one node and the at least one peripheral electronic device.

32. (Original) The method of claim 1, further comprising implementing at least one security method selected from a group consisting of confounder codes, encrypted transmissions, security policy-based communication protocols, blocking coupling with unauthorized devices, and blocking commands from at least one class of device.

33. (Original) The method of claim 32, wherein the at least one security method includes blocking denial of service attacks by decoupling at least one port node through which unauthorized access is attempted and blocking at least one application at a decoupled port node.

34. (Original) The method of claim 32, wherein the at least one security method further includes at least one device selected from a group consisting of an ignition key, a password device, a security display, and a designated authorization port, wherein at least one connector is

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coupled to the designated authorization port to receive authorization for coupling a device to the plurality of network elements.

35. (Original) The method of claim 1, further comprising automatically organizing the plurality of network elements in response to the node information, wherein the automatic organizing comprises automatically controlling data transfer, processing, and storage among the plurality of network elements.

36. (Original) The method of claim 1, further comprising supporting at least one level of synchronization among different subsets of the plurality of network elements, wherein a first level of synchronization is supported among a first subset of the plurality of network elements, wherein a second level of synchronization is support among a second subset of the plurality of network elements.

37. (Original) The method of claim 1, further comprising self-assembling the plurality of network elements, wherein search and acquisition modes of the at least one node search for participating ones of the plurality of network elements, wherein a determination is made whether each of the participating ones of the plurality of network elements are permitted to join the vehicle internetworking using a message hierarchy, wherein the plurality of network elements are surveyed at random intervals for new nodes and missing nodes.

38. (Original) The method of claim 1, further comprising performing service discovery, wherein service discovery comprises:

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synchronizing the at least one node;

authenticating the at least one node;

determining at least one communication mode for the at least one node; and

informing the at least one node of resources available among the plurality of network elements.

39. (Original) The method of claim 1, further comprising collecting data using the at least one node, wherein at least one operation is performed on the data in response to parameters established by a user, the at least one operation selected from a group consisting of classification, routing, processing, storing, and fusing.

40. (Original) The method of claim 39, wherein the data is vehicle diagnostic data, wherein diagnostic operations are performed in response to the data.

41. (Original) The method of claim 39, wherein routing comprises selecting at least one communication type and at least one communication coupling for use in routing the collected data.

42. (Original) The method of claim 39, wherein routing comprises selecting at least one data type for routing, selecting at least one of the plurality of network elements to which to route the selected data, selecting at least one route to the selected at least one of the plurality of network elements, and routing the selected at least one data type to the selected at least one of the plurality of network elements.

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43. (Original) The method of claim 39, wherein processing comprises selecting at least one data type for processing, selecting at least one processing type, selecting at least one of the plurality of network elements to perform the selected at least one processing type, and transferring the selected at least one data type to the selected at least one of the plurality of network elements using at least one route through the sensor network.

44. (Original) The method of claim 43, further comprising aggregating processed data for further processing.

45. (Original) The method of claim 43, further comprising:

aggregating processed data;

reporting aggregated data to at least one user.

46. (Original) The method of claim 39, wherein storing comprises selecting at least one data type for storage, selecting at least one storage type, selecting at least one of the plurality of network elements to perform the selected at least one storage type, and transferring the selected at least one data type to the selected at least one of the plurality of network elements using at least one route through the plurality of network elements.

47. (Original) The method of claim 39, wherein fusing comprises a first node transmitting at least one query request to at least one other node, wherein the first node collects data from the at least one other node in response to the at least one query request, and processes

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the collected data.

48. (Original) The method of claim 1, wherein the plurality of network elements comprise a plurality of application programming interfaces (APIs), wherein the APIs include APIs for application support, database services, routing, security, network management, and deployment.

49. (Original) The method of claim 48, further comprising:

hosting the APIs for application support, database services, and routing on at least one gateway node;

sharing the APIs for security, network management, and deployment among at least one gateway node and at least one port node.

50. (Original) The method of claim 48, further comprising:

layering the plurality of APIs;

enabling distributed resource management by providing network resource information among the plurality of network elements;

establishing a synchronism hierarchy in response to the network resource information;

controlling information transfer among the plurality of network elements using the synchronism hierarchy.

51. (Original) The method of claim 1, further comprising supporting atomic transactions.

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52. (Original) The method of claim 1, wherein the at least one node includes sensing, processing, communications, and storage devices supporting a plurality of processing and protocol layers.

53. (Original) The method of claim 1, further comprising supporting at least one communication mode selected from a group consisting of wireless communications, wired communications, and hybrid wired and wireless communications.

54. (Currently amended) The method of claim 1, ~~further comprising coupling the at least one node to the at least one remote computer using the plurality of network elements,~~

wherein the plurality of networks elements include at least one element selected from a group consisting of at least one station gateway, at least one server, at least one repeater, at least one interrogator, and at least one network, and

wherein the at least one network includes wired networks, wireless networks, and hybrid wired and wireless networks.

55. (Original) The method of claim 54, wherein the at least one network comprises at least one network selected from a group comprising the Internet, local area networks, wide area networks, metropolitan area networks, and information service stations.

56. (Original) The method of claim 54, further comprising providing remote accessibility using World Wide Web-based tools to data, code, control, and security functions, wherein data

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includes signals, wherein code includes signal processing, decision support, and database elements, and wherein control includes operation of the plurality of network elements.

57. (Original) The method of claim 1, wherein the plurality of network elements comprise a plurality of network element sets, wherein the plurality of network element sets are layered.

58. (Original) The method of claim 1, further comprising:

assembling a first network having a first node density using at least one node of a first type;

assembling a second network having a second node density using at least one node of a second type;

overlaying the second network onto the first network.

59. (Original) The method of claim 1, further comprising:

transferring software and data among the plurality of network elements, wherein the transfer is remotely controllable;

downloading the software and data from at least one location selected from a group consisting of storage devices of the plurality of network elements, external storage devices, and remote storage devices.

60. (Original) The method of claim 1, further comprising:

managing the plurality of network elements as at least one distributed and active

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database at least one distributed resource management protocol;

reusing the plurality of network elements among different applications;

using the plurality of network elements in multiple classes of applications.

61. (Original) The method of claim 1, further comprising transferring data among the plurality of network elements using at least one coupling among the at least one node and at least one external network, wherein the data includes vehicle service data, diagnostic data, maintenance history data, security data, electronic mail, and entertainment software.

62. (Original) The method of claim 1, further comprising transferring data among the plurality of network elements using at least one coupling among the at least one peripheral electronic device and at least one external network, wherein the data includes vehicle service data, diagnostic data, maintenance history data, security data, electronic mail, and entertainment software.

63. (Original) The method of claim 1, further comprising coupling the at least one node to at least one diagnostic device of a host vehicle.

64. (Original) The method of claim 1, wherein the at least one node comprises at least one diagnostic node of a host vehicle.

65. (Original) The method of claim 1, further comprising manipulating at least one data item selected from a group consisting of vehicle assembly data, vehicle maintenance data,

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vehicle diagnostics data, vehicle position data, vehicle operations profile data, fleet management data, fleet reliability analysis data, security system data, entertainment system data, and targeted advertising data.

66. (Currently amended) A method for internetworking, comprising:

coupling a plurality of network elements in a vehicle, the vehicle including at least one electronic device, ~~among~~ at least one node and at least one vehicle bus, wherein the at least one node includes at least one gateway node in the vehicle, the gateway node comprising a first processor performing real-time processes and a second processor performing remaining processes other than the real-time processes;

at least one remote computer remotely accessing the plurality of network elements via ~~using~~ at least one wireless Internet coupling ~~and at least one remote computer~~;

the at least one node manipulating network data including configuration and security data; and

the at least one node providing secure and private interoperability among the plurality of network elements.

67-75. (Canceled)

76. (New) The method of claim 1, wherein the vehicle comprises a motor vehicle.

77. (New) A method for internetworking, comprising:

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in a motor vehicle comprising a gateway node, a first vehicle bus that carries communications according to a first communication protocol, a second vehicle bus that carries communications according to a second communication protocol, and a plurality of network elements, wherein the plurality of network elements includes a first set of network elements connected to the first vehicle bus, and a second set of network elements connected to the second vehicle bus, the gateway node coupling the plurality of network elements in the motor vehicle;

the plurality of network elements automatically assembling to form a network in which the gateway node provides a bridge between the first vehicle bus and the second vehicle bus, wherein the bridge is operable to pass messages between the first vehicle bus and the second vehicle bus;

at least one network element of the assembled plurality of network elements coupling to a remote computer located outside of the motor vehicle; and

the remote computer remotely controlling at least one function of the assembled plurality of network elements.

78. (New) The method of claim 77, the method further comprising:

the gateway node instructing a misbehaving network element of the plurality of network elements to shut down.

79. (New) The method of claim 77, further comprising:

the gateway node blocking the communication of at least one message between the first vehicle bus and the second vehicle bus.

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80. (New) The method of claim 77,

wherein the gateway node comprises at least one hybrid switch,

wherein the at least one hybrid switch includes at least one interface port coupled to a switch of a first speed and to a switch of a second speed, and

wherein the switch of the first speed is coupled to the first vehicle bus, and the switch of the second speed is coupled to the second vehicle bus.

81. (New) The method of claim 80, wherein the gateway node comprises a first processor performing real-time processes and a second processor performing high level processing functions.

82. (New) The method of claim 77,

wherein the first vehicle bus is an original equipment manufacturer (OEM) bus that carries out communications using a controller area network (CAN) protocol, and

wherein the second vehicle bus comprises a bus that carries out communications using a protocol selected from the group consisting of (i) an IEEE 1394 protocol, (ii) a MOST protocol, and an intelligent data bus (IDB-C) protocol.

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